

REMARKS/ARGUMENTS

In this response, no claims have been amended, canceled or added. Thus Claims 1-6 and 9-24 remain pending.

On page 2 of the Office Action, Examiner stated that the rejection of claims under 35 U.S.C. § 112, 1st paragraph will not be maintained in light of amendment filed September 18, 2006. Applicant thanks Examiner for considering Applicant's arguments and withdrawing the rejection of claims under 35 U.S.C. § 112.

On page 2 of the Office Action, Examiner also stated that the rejections of claims under 35 U.S.C. § 103(a) in the office action mailed May 18, 2006 will not be maintained in light of amendment filed September 18, 2006. Examiner stated that none of the references recite that PEG-castor oil enhances the consistency of the composition. Examiner stated that Applicant's arguments filed on September 18, 2006, with respect to the rejection(s) of claim(s) under 35 U.S.C. § 103(a) have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. Applicant thanks Examiner for considering Applicant's arguments and withdrawing the rejection of claims under 35 U.S.C. § 103(a).

I. Rejections Under 35 U.S.C. § 103(a) Based upon Dotolo and PEG-castor oil

The Examiner rejected Claims 1-6, 9-11, 13-17, 22, and 23 under 35 U.S.C. § 103(a) as being unpatentable over Dotolo, U.S. Patent No. 4,379,168 ("Dotolo"). Specifically, Examiner

states:

Dotolo teaches a composition comprising 20% d-limonene, 4% emulsifier (surfactant), and remainder water (76%). See Example 14. Dotolo teaches a composition comprising 20% d-limonene, 4% emulsifier (surfactant), and remainder water (76%). See Example 14. Dotolo teaches that the d-limonene contains a preservative. See column 6 lines 40-43. Dotolo teaches that the composition can repel or kill insects. See column 7 lines 34-43. Dotolo teaches that the composition controls lice. See column 7 lines 3-4. Dotolo teaches a method of applying the composition to house surfaces such as walls and floors and to animals as a topical application. See column 7 lines 5-11. Dotolo teaches that the composition can be made by the simple act of mixing d-limonene, emulsifier, and remainder water. See claims 34-36. Dotolo teaches that nonionic emulsifiers (surfactants) such as TON X-100 and IGEPAL CO-630 are specifically used in his invention. See column 1 lines 52-68. Dotolo explains that these surfactants contain a number of ethylene oxide (EO) units. See column 1 line 68-column 2 line 3. Dotolo also teaches that his invention is open to other suitable surfactants, which can be nonionic, cation, and amphoteric type. See column 2 lines 4-10. Dotolo teaches all that is recited in claims except for the invention comprising 1) a polyethoxylated castor oil surfactant and 2) amount (0.01-5%) of preservative. However, in the absence of a showing of unexpected results for the prior art surfactants versus PEG-castor oil, it would be obvious to one having ordinary skill in the art to modify the invention taught by Dotolo to include PEG-castor oil. One would have been expected to do this since Dotolo is open to inclusion of suitable surfactants and since PEG-castor oil contains a number of EO units which are units also contained in the TON X-100 and IGEPAL CO-630 surfactants (note that PEG-castor oil, TON X-100 and IGEPAL CO-630 are non-ionic surfactants). One would have been motivated to do this because all three surfactants are similar in chemical and physical properties and therefore, would have been expected to exhibit a similar function when used in the same capacity. It would have been obvious to one having ordinary skill in the art to determine the optimum amount of preservative to include in the composition. One would have been motivated to do this in order to prevent the composition from being rancid.

Office Action, dated 12/05/2006, at pages 2-4. For the reasons set forth below, Applicant respectfully disagrees.

The Examiner has not identified a teaching, suggestion, or motivation that would have led a person of ordinary skill in the art to combine the relevant teachings in the manner claimed. Teleflex Inc. v. KSR International Co., (Fed. Cir. 2005).

The Examiner states that "one would have been motivated to do this [modify the invention taught by Dotolo to include PEG-castor oil] because all three surfactants are similar in chemical and physical properties and therefore, would have been expected to exhibit a similar function." However, the chemical/physical properties of the surfactants disclosed in Dotolo (Triton X-100 and IGEPAL CO-630) **do not** have similar chemical and physical properties to the surfactant disclosed in the instant invention, PEG-castor oil. Moreover, there is nothing in Dotolo that expressly or implicitly teaches that chemicals with chemical and physical properties similar to polyethoxylated castor oil would be desirable. Attached as Exhibits A, B, and C hereto are the Material Safety Data Sheets ("MSDS") for IGEPAL CO-630 obtained from Sigma-Aldrich, Triton-100 obtained from Sigma-Aldrich, and PEG-castor oil with the trade name Alkamuls EL-620 (as described in p.3 of the specification) obtained from Rhodia, respectively.

Moreover, the Examiner states that "in the absence of a showing of unexpected results for the prior art surfactants versus castor oil, it would have been obvious to one having

ordinary skill in the art to modify the invention taught by Dotolo to include PEG-castor oil." However, a showing of unexpected results is *not required* to show that an invention is nonobvious. A showing of unexpected results *may* be used to rebut a prima facie case for obviousness, i.e., when there has been a showing of a teaching, suggestion, or motivation to combine. However, the Examiner has not shown a teaching, suggestion, or motivation to combine. Therefore, the prima facie case of obviousness has not been met and the question of unexpected results does not even come into play.

Furthermore, unlike the present invention, Dotolo does not recognize the need to provide a food-grade composition or the suitability of PEG-castor oil for addressing that need. "The mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests a desirability of the combination." MPEP 2143.01; In re Mills, 916 F. 2d 680, 16 U.S.P.Q. 2d 1430 (Fed. Cir. 1990).

Furthermore, the factual inquiry as to combining references must be based on the objective evidence of record. In re Sang-Su Lee, 277 F. 3d 1338, 1343 (Fed. Cir. 2002). In Sang-Su Lee the Federal Circuit reversed a Board of Patent Appeals and Interferences finding of obviousness, holding that "[t]his factual question of motivation is material to patentability, and could not be resolved on subjective belief and unknown authority." Id. at 1343-1344.

The combination of Dotolo and PEG-castor oil is

improper because 1) there is no support for the proposition that TRITON X-100 or IGEPAL CO-630 has similar chemical and physical properties to that of PEG-castor oil and 2) Dotolo does not describe a need to have a "food grade" surfactant that would have motivated one of ordinary skill in the art to combine Dotolo with PEG-castor oil.

In view of the foregoing, Applicant submits that the 35 U.S.C. § 103 rejection be withdrawn. Reconsideration and withdrawal of the rejection are respectfully requested.

II. Rejections under 35 U.S.C. § 102 under Liebman

The Examiner rejected claims 1-3, 6, 7, 9, 11-15, 20, 21, and 24 under 35 U.S.C. § 102(b) as being obvious over Liebman (CA 2060594). Applicant respectfully notes that claim 7 has been previously cancelled and therefore is no longer pending. Specifically, Examiner states:

Liebman teaches a method of applying a shampoo or lotion composition comprising d-limonene, emulsifiers, (cocoamido propyl betaine, sodium lauryl sulphate, ethyl methacrylate) and water and/or alcohol to human head to contact lice. Liebman teaches that the method is used to prevent lice infestation in human hair and on skin. See page 1, lines 5-8, page 3 lines 5-22, page 6 examples. Liebman teaches generically that emulsifiers can be added to the invention. See page 4 lines 16-19. Liebman also teaches that modifications to the disclosed embodiments can be made without departing from the scope of his invention. See page 9 lines 26-29. Liebman teaches all that is recited in the claims expect for the invention comprising 1) a polyethoxylated castor oil and 2) instant amounts/ranges of ingredients: d-limonene, emulsifying agent, and hydrophilic solvent. However, in the absence

of showing of unexpected results for the prior art surfactants versus PEG-castor oil, it would have been obvious to one having ordinary skill in the art to modify the invention taught by Liebman to include PEG-castor oil. One would have been expected to do this since Liebman generically teaches the inclusion of surfactants (emulsifiers) and since Liebman also teaches that modification to the disclosed embodiments can be made without departing from the scope of his invention. With respect to the amount/ranges of ingredients, one having ordinary skill in the art would have been expected to determine the optimum amounts ranges of ingredients. One would have been motivated to do this in order to develop a lotion that would have been effective in killing lice, but yet non-toxic to the animals being treated.

Office Action, dated 12/5/06, at pages 4-5. For the reasons set forth below, Applicant respectfully disagrees.

Examiner states "Liebman teaches all that is recited in claims except for the invention comprising 1) polyethoxylated castor oil and 2) instant amounts/ranges of ingredients: d-limonene, emulsifying agent, and hydrophilic solvent. However, in the absence of showing of **unexpected results** for the prior art surfactants versus PEG-castor oil, it would have been **obvious** to one having ordinary skill in the art to modify the invention taught by Liebman..."

Applicant respectfully notes, however, that the appropriate standard for anticipation under 35 U.S.C. § 102(b), is that the reference must teach each and every element of the claim. Applicant respectfully submits that Liebman does not teach each and every element of the Claims 1-3, 6, 9, 11-15, 20, 21, and 24.

Each of Claims 1-3, 6, 9, 11-15, 20, 21, and 24 require that the insecticidal compositions contain castor oil and are food-grade and non-toxic. As Examiner notes, there is no disclosure in Liebman to an insecticidal composition that contains castor oil. [Office Action, page 4]. Moreover, Liebman does not disclose - or even suggest the need for - a food grade composition or the use of food grade ingredients. Therefore, Liebman cannot anticipate the rejected claims. In the alternative, Liebman cannot be used to render the instant invention obvious, as Liebman does not have any teaching, suggestion, or motivation to modify the invention with a food-grade composition.

In view of the foregoing, Applicant respectfully submits that the § 102(b) rejections are overcome with respect to claims 1-3, 6, 9, 11-15, 20, 21, and 24 as each of these claims require an insecticidal composition that contains castor oil and ingredients which are food grade and non-toxic to humans. As explained above, there is no corresponding disclosure in Liebman for insecticidal compositions which contain castor oil or which are composed entirely of food-grade and non-toxic ingredients.

III. Rejections under 35 U.S.C. § 103(a) over Wilkins, Jr.

The Examiner also rejected Claims 1, 2, 6, 7, 9, 11-15, 17-19, 21, and 24 as obvious over Wilkins Jr., U.S. Patent No.

5,951,992 ("Wilkins"). Applicant respectfully indicates that claim 7 was previously cancelled.

Examiner states that Wilkins teaches a method of applying a composition comprising 2-10% D-limonene, 1-10% emulsifier, and 80-96% water to crop or plants to control fire ant infestation. However, Examiner also states that Wilkins does not teach PEG-castor oil or the invention comprising the claimed amounts/ranges of D-limonene, emulsifying agent, and hydrophilic solvent. Reconsideration and withdrawal of the rejection are respectfully requested.

Wilkins teaches a method of applying a D-limonene composition to control fire ants. The only emulsifier disclosed in Wilkins is MAZCLEAN EP. As with Liebman, Wilkins fails to disclose a food-grade insecticidal composition that comprises castor oil. In addition, the Examiner has neither asserted nor presented any evidence suggesting that MAZCLEAN EP is non-toxic to humans. Attached as Exhibit D is a data sheet for MAZCLEAN EP, obtained from a BASF Corporate website. The data sheet indicates that MAZCLEAN EP is a "monocyclic terpene hydrocarbon." Because Wilkins does not disclose a food-grade insecticidal compositions comprising castor oil, Wilkins does not disclose or render obvious the invention in Claims 1, 2, 6, 9, 11-15, 21, 24, and 25.

Moreover, each of Claims 1, 2, 6, 7, 9, 11-15, 21, 24,

and 25 are directed to food-grade insecticidal compositions comprising castor oil. Wilkins neither teaches nor suggests the use of castor oil in any of its compositions and therefore cannot render Claims 1, 2, 6, 7, 9, 11-15, 21, 24, and 25 obvious.

In view of the foregoing discussion, Applicant submits that the § 103 rejections are overcome. Thus, Applicant respectfully requests that the 35 U.S.C. § 103 rejections be withdrawn.

CONCLUSION

In view of the foregoing, it is believed that all claims now pending patentably define the subject invention over the prior art of record and are in condition for allowance.

Respectfully submitted,

JEFFER, MANGELS, BUTLER & MARMARO LLP

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EXHIBIT A

MATERIAL SAFETY DATA SHEET

Date Printed: 03/02/2007

Date Updated: 02/16/2006

Version 1.5

Section 1 - Product and Company Information

Product Name	IGEPAL CO-630
Product Number	542334
Brand	ALDRICH
Company	Sigma-Aldrich
Address	3050 Spruce Street SAINT LOUIS MO 63103 US
Technical Phone:	800-325-5832
Fax:	800-325-5052
Emergency Phone:	314-776-6555

Section 2 - Composition/Information on Ingredient

Substance Name	CAS #		SARA 313
IGEPAL CO-*	68412-54-4		No
Ingredient Name	CAS #	Percent	SARA 313
1,4-DIOXANE	123-91-1	< 0.003	Yes
ETHYLENE OXIDE	75-21-8	< 0.0005	Yes
Formula	(C2H4O)n·C15H24O		
Synonyms	Alkylphenol ethoxylate * nonylphenoxy poly(ethyleneoxy)ethanol, branched * ethoxylated nonylphenol, branched		

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Irritant.

Irritating to skin.

Calif. Prop. 65 carcinogen & developmental hazard.

HMIS RATING

HEALTH: 2

FLAMMABILITY: 1

REACTIVITY: 0

NFPA RATING

HEALTH: 2

FLAMMABILITY: 1

REACTIVITY: 0

For additional information on toxicity, please refer to Section 11.

Section 4 - First Aid Measures

ORAL EXPOSURE

If swallowed, wash out mouth with water provided person is conscious. Call a physician.

INHALATION EXPOSURE

If inhaled, remove to fresh air. If not breathing give artificial respiration. If breathing is difficult, give oxygen.

DERMAL EXPOSURE

In case of contact, immediately wash skin with soap and copious amounts of water.

EYE EXPOSURE

In case of contact, immediately flush eyes with copious amounts of water for at least 15 minutes.

Section 5 - Fire Fighting Measures

FLASH POINT

212 °F 100 °C Method: closed cup

AUTOIGNITION TEMP

N/A

FLAMMABILITY

N/A

EXTINGUISHING MEDIA

Suitable: Carbon dioxide, dry chemical powder, or appropriate foam.

FIREFIGHTING

Protective Equipment: Wear self-contained breathing apparatus and protective clothing to prevent contact with skin and eyes.
Specific Hazard(s): Emits toxic fumes under fire conditions.

Section 6 - Accidental Release Measures

PROCEDURE(S) OF PERSONAL PRECAUTION(S)

Wear respirator, chemical safety goggles, rubber boots, and heavy rubber gloves.

METHODS FOR CLEANING UP

Absorb on sand or vermiculite and place in closed containers for disposal. Ventilate area and wash spill site after material pickup is complete.

Section 7 - Handling and Storage

HANDLING

User Exposure: Do not breathe vapor. Avoid contact with eyes, skin, and clothing. Avoid prolonged or repeated exposure.

STORAGE

Suitable: Keep tightly closed.

Section 8 - Exposure Controls / PPE

ENGINEERING CONTROLS

Mechanical exhaust required. Safety shower and eye bath.

PERSONAL PROTECTIVE EQUIPMENT

Respiratory: Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU). Where risk assessment shows air-purifying respirators are appropriate use a full-face respirator with multi-purpose combination (US) or type ABEK (EN 14387) respirator cartridges as

a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator.
Hand: Compatible chemical-resistant gloves.
Eye: Chemical safety goggles.

GENERAL HYGIENE MEASURES

Wash thoroughly after handling.

Section 9 - Physical/Chemical Properties

Appearance	Physical State: Clear viscous liquid Color: Colorless	
Property	Value	At Temperature or Pressure
pH	6.0 - 8.0	Concentration: 100 g/l
BP/BP Range	> 200 °C	760 mmHg
MP/MP Range	N/A	
Freezing Point	N/A	
Vapor Pressure	< 0.01 mmHg	25 °C
Vapor Density	N/A	
Saturated Vapor Conc.	N/A	
SG/Density	0.96 g/cm3	
Bulk Density	N/A	
Odor Threshold	N/A	
Volatile%	< 0.5 %	
VOC Content	N/A	
Water Content	N/A	
Solvent Content	N/A	
Evaporation Rate	N/A	
Viscosity	0.012 - 0.014 Pas	100 °C
Surface Tension	N/A	
Partition Coefficient	N/A	
Decomposition Temp.	N/A	
Flash Point	212 °F 100 °C	Method: closed cup
Explosion Limits	N/A	
Flammability	N/A	
Autoignition Temp	N/A	
Refractive Index	1.508	
Optical Rotation	N/A	
Miscellaneous Data	N/A	
Solubility	Solubility in Water: Soluble.	

N/A = not available

Section 10 - Stability and Reactivity

STABILITY

Stable: Stable.
Conditions to Avoid: Heat. spark open flame
Materials to Avoid: Strong oxidizing agents, Strong reducing agents.

HAZARDOUS POLYMERIZATION

Hazardous Polymerization: Will not occur

Section 11 - Toxicological Information

ROUTE OF EXPOSURE

Skin Contact: Causes skin irritation.
Skin Absorption: May be harmful if absorbed through the skin.
Eye Contact: May cause eye irritation.

Inhalation: Material is irritating to mucous membranes and upper respiratory tract. May be harmful if inhaled.
Ingestion: May be harmful if swallowed.

SIGNS AND SYMPTOMS OF EXPOSURE

Nausea, headache, and vomiting. Exposure can cause: To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

TOXICITY DATA

Oral
Rat
4000 mg/kg
LD50

IRRITATION DATA

Skin
Remarks: Moderate irritation effect
Eyes
Remarks: Severe irritation effect Mild irritation effect

Section 12 - Ecological Information

ACCUMULATION

Bioaccumulation Potential: Indication of bioaccumulation.

ACUTE ECOTOXICITY TESTS

Test Type: LC50 Fish
Species: Lepomis macrochirus (Bluegill)
Time: 96 h
Value: > 10 mg/l

Section 13 - Disposal Considerations

APPROPRIATE METHOD OF DISPOSAL OF SUBSTANCE OR PREPARATION

Contact a licensed professional waste disposal service to dispose of this material. Dissolve or mix the material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber. Observe all federal, state, and local environmental regulations.

Section 14 - Transport Information

DOT

Proper Shipping Name: Environmentally hazardous substances, liquid, n.o.s.
UN#: 3082
Class: 9
Packing Group: Packing Group III
Hazard Label: Class 9
PIH: Not PIH

IATA

Non-Hazardous for Air Transport: Non-hazardous for air transport.

Section 15 - Regulatory Information

EU ADDITIONAL CLASSIFICATION

Symbol of Danger: Xi
Indication of Danger: Irritant.
R: 38
Risk Statements: Irritating to skin.

US CLASSIFICATION AND LABEL TEXT

Indication of Danger: Irritant.
Risk Statements: Irritating to skin.
US Statements: Calif. Prop. 65 carcinogen & developmental hazard.

UNITED STATES REGULATORY INFORMATION

SARA LISTED: No
TSCA INVENTORY ITEM: Yes

UNITED STATES - STATE REGULATORY INFORMATION

CALIFORNIA PROP - 65

California Prop - 65: This product is or contains chemical(s) known to the state of California to cause cancer. This product is or contains chemical(s) known to the state of California to cause female developmental toxicity.

CANADA REGULATORY INFORMATION

WHMIS Classification: This product has been classified in accordance with the hazard criteria of the CPR, and the MSDS contains all the information required by the CPR.
DSL: Yes
NDSL: No

Section 16 - Other Information

DISCLAIMER

For R&D use only. Not for drug, household or other uses.

WARRANTY

The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Inc., shall not be held liable for any damage resulting from handling or from contact with the above product. See reverse side of invoice or packing slip for additional terms and conditions of sale. Copyright 2007 Sigma-Aldrich Co. License granted to make unlimited paper copies for internal use only.

EXHIBIT B

MATERIAL SAFETY DATA SHEET

Date Printed: 03/02/2007

Date Updated: 10/20/2006

Version 1.15

Section 1 - Product and Company Information

Product Name	TRITON X-100
Product Number	234729
Brand	SIAL
Company	Sigma-Aldrich
Address	3050 Spruce Street SAINT LOUIS MO 63103 US
Technical Phone:	800-325-5832
Fax:	800-325-5052
Emergency Phone:	314-776-6555

Section 2 - Composition/Information on Ingredient

Substance Name	CAS #	SARA 313
P-TERTIARY-OCTYLPHENOXY POLYETHYL ALCOHOL	9002-93-1	No

Formula (C2H4O)nC14H22O

Synonyms AntaroX A-200 * Ethoxylated p-tert-octylphenol *
Hydrol SW * Octylphenoxypolyethoxyethanol *
Polyethylene glycol
mono(p-(1,1,3,3-tetramethylbutyl)phenyl) ether *
Polyethylene glycol
p-1,1,3,3-tetramethylbutylphenyl ether *
Polyethyleneglycol 4-(tert-octyl)phenyl ether *
Poly(oxy-1,2-ethanediyl),
alpha-(4-(1,1,3,3-tetramethylbutyl)phenyl)-omega-hydroxy- (9CI) * Preceptin * TexofoR FP 300 *
Triton X * Triton X 100 * Triton X 101 * Triton X 165 * Triton X 305 * Triton X 405 * Triton X 705
* TX 100 * Triton * IGEPAI *
Polyoxyethylene(*)octylphenyl ether, branched

RTECS Number: MD0907700

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Harmful. Dangerous for the environment.

Harmful if swallowed. Risk of serious damage to eyes. Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

HMIS RATING

HEALTH: 2

FLAMMABILITY: 1

REACTIVITY: 0

NFPA RATING

HEALTH: 2

FLAMMABILITY: 1

REACTIVITY: 0

For additional information on toxicity, please refer to Section 11.

Section 4 - First Aid Measures

ORAL EXPOSURE

If swallowed, wash out mouth with water provided person is conscious. Call a physician.

INHALATION EXPOSURE

If inhaled, remove to fresh air. If breathing becomes difficult, call a physician.

DERMAL EXPOSURE

In case of contact, immediately wash skin with soap and copious amounts of water.

EYE EXPOSURE

In case of contact with eyes, flush with copious amounts of water for at least 15 minutes. Assure adequate flushing by separating the eyelids with fingers. Call a physician.

Section 5 - Fire Fighting Measures

FLASH POINT

485 °F 251 °C Method: closed cup

AUTOIGNITION TEMP

N/A

FLAMMABILITY

N/A

EXTINGUISHING MEDIA

Suitable: Water spray. Carbon dioxide, dry chemical powder, or appropriate foam. Foam and water spray are effective but may cause frothing.

FIREFIGHTING

Protective Equipment: Wear self-contained breathing apparatus and protective clothing to prevent contact with skin and eyes.
Specific Hazard(s): Emits toxic fumes under fire conditions.

Section 6 - Accidental Release Measures

PROCEDURE TO BE FOLLOWED IN CASE OF LEAK OR SPILL

Evacuate area.

PROCEDURE(S) OF PERSONAL PRECAUTION(S)

Wear self-contained breathing apparatus, rubber boots, and heavy rubber gloves.

METHODS FOR CLEANING UP

Absorb on sand or vermiculite and place in closed containers for disposal. Ventilate area and wash spill site after material pickup is complete.

ENVIRONMENTAL PRECAUTION(S)

Avoid contaminating water supply. Do not allow material to enter drains or water courses.

Section 7 - Handling and Storage

HANDLING

User Exposure: Do not breathe vapor. Avoid contact with eyes, skin, and clothing. Avoid prolonged or repeated exposure.

STORAGE

Suitable: Keep tightly closed.

Section 8 - Exposure Controls / PPE

ENGINEERING CONTROLS

Safety shower and eye bath. Mechanical exhaust required.

PERSONAL PROTECTIVE EQUIPMENT

Respiratory: Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU). Where risk assessment shows air-purifying respirators are appropriate use a full-face respirator with multi-purpose combination (US) or type AXBEK (EN 14387) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator.
Hand: Compatible chemical-resistant gloves.
Eye: Chemical safety goggles.

GENERAL HYGIENE MEASURES

Wash thoroughly after handling.

EXPOSURE LIMITS

Country	Source	Type	Value
	ACGIH	TLV	1 ppm

Section 9 - Physical/Chemical Properties

Appearance	Physical State: Clear liquid Color: Faintly yellow	
Property	Value	At Temperature or Pressure
pH	9.7	
BP/BP Range	> 200 °C	
MP/MP Range	N/A	
Freezing Point	6 °C	
Vapor Pressure	< 1 mmHg	20 °C
Vapor Density	> 1 g/l	
Saturated Vapor Conc.	N/A	
SG/Density	1.07 g/cm3	
Bulk Density	N/A	
Odor Threshold	N/A	
Volatile%	65 %	
VOC Content	N/A	
Water Content	N/A	
Solvent Content	N/A	
Evaporation Rate	< 0.01	
Viscosity	N/A	
Surface Tension	N/A	
Partition Coefficient	N/A	
Decomposition Temp.	N/A	
Flash Point	485 °F 251 °C	Method: closed cup
Explosion Limits	N/A	
Flammability	N/A	
Autoignition Temp	N/A	
Refractive Index	1.49 1.49	

Optical Rotation	N/A
Miscellaneous Data	N/A
Solubility	Solubility in Water: Soluble.

N/A = not available

Section 10 - Stability and Reactivity

STABILITY

Stable: Stable.

Materials to Avoid: Strong acids, Strong bases, Strong oxidizing agents.

HAZARDOUS DECOMPOSITION PRODUCTS

Hazardous Decomposition Products: Carbon monoxide, Carbon dioxide.

HAZARDOUS POLYMERIZATION

Hazardous Polymerization: Will not occur

Section 11 - Toxicological Information

ROUTE OF EXPOSURE

Skin Contact: May cause skin irritation.

Skin Absorption: May be harmful if absorbed through the skin.

Eye Contact: Causes severe eye irritation.

Inhalation: Material may be irritating to mucous membranes and upper respiratory tract. May be harmful if inhaled.

Ingestion: Harmful if swallowed.

SIGNS AND SYMPTOMS OF EXPOSURE

To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

TOXICITY DATA

Oral

rat, female

707 mg/kg

LD50

Oral

rat, male

500 mg/kg

LD50

Skin

Rabbit

12,300 mg/kg

LD50

Skin

Rabbit

9,000 mg/kg

LD50

Oral

Rat

1800 mg/kg

LD50

Intravenous

Mouse

1200 MG/KG

LD50

IRRITATION DATA

Eyes
Rabbit
0.01 ml
Remarks: Severe irritation effect
Eyes
Rabbit
0.01 ml

Skin
Rabbit
0.5 ml
24H
Remarks: Mild irritation effect

Eyes
Rabbit
0.01 ml
24H
Remarks: Moderate irritation effect

CHRONIC EXPOSURE - MUTAGEN

Species: Human
Dose: 21 MG/L
Cell Type: HeLa cell
Mutation test: DNA inhibition

Species: Human
Dose: 14 MG/L
Cell Type: HeLa cell
Mutation test: Other mutation test systems

Species: Mouse
Dose: 200 PPM
Cell Type: Ascites tumor
Mutation test: Unscheduled DNA synthesis

CHRONIC EXPOSURE - REPRODUCTIVE HAZARD

Species: Rat
Dose: 65500 MG/KG
Route of Application: Oral
Exposure Time: (26W PRE)
Result: Maternal Effects: Ovaries, fallopian tubes.

Species: Rat
Dose: 40 ML/KG
Route of Application: Skin
Exposure Time: (6-15D PREG)
Result: Specific Developmental Abnormalities: Musculoskeletal system. Maternal Effects: Other effects.

Species: Rat
Dose: 5 MG/KG
Route of Application: Parenteral
Exposure Time: (1D PRE)
Result: Maternal Effects: Ovaries, fallopian tubes.

Section 12 - Ecological Information

ACUTE ECOTOXICITY TESTS

Test Type: IC50 Algae
Species: other microorganisms
Value: 5,000 mg/l

Test Type: EC50 Daphnia
Species: Daphnia
Time: 48 h
Value: 26 mg/l

Test Type: LC50 Fish
Species: Pimephales promelas (Fathead minnow)
Time: 96 h
Value: 8.9 mg/l

ELIMINATION

Elimination: 90 %

Section 13 - Disposal Considerations

APPROPRIATE METHOD OF DISPOSAL OF SUBSTANCE OR PREPARATION

Contact a licensed professional waste disposal service to dispose of this material. Dissolve or mix the material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber. Observe all federal, state, and local environmental regulations.

Section 14 - Transport Information

DOT

Proper Shipping Name: Environmentally hazardous substances, liquid, n.o.s.
UN#: 3082
Class: 9
Packing Group: Packing Group III
Hazard Label: Class 9
PIH: Not PIH

IATA

Proper Shipping Name: Environmentally hazardous substance, liquid, n.o.s.
IATA UN Number: 3082
Hazard Class: 9
Packing Group: III

Section 15 - Regulatory Information

EU ADDITIONAL CLASSIFICATION

Symbol of Danger: Xn-N
Indication of Danger: Harmful. Dangerous for the environment.
R: 22-41-51/53
Risk Statements: Harmful if swallowed. Risk of serious damage to eyes. Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
S: 26-36/39-61
Safety Statements: In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. Wear suitable protective clothing and eye/face protection. Avoid release to the environment. Refer to special instructions/safety data sheets.

US CLASSIFICATION AND LABEL TEXT

Indication of Danger: Harmful. Dangerous for the environment.
Risk Statements: Harmful if swallowed. Risk of serious damage to eyes. Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
Safety Statements: In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. Wear suitable protective clothing and eye/face protection. Avoid release to the environment. Refer to special instructions/safety data sheets.

UNITED STATES REGULATORY INFORMATION

SARA LISTED: No

TSCA INVENTORY ITEM: Yes

CANADA REGULATORY INFORMATION

WHMIS Classification: This product has been classified in accordance with the hazard criteria of the CPR, and the MSDS contains all the information required by the CPR.

DSL: Yes

NDSL: No

Section 16 - Other Information

DISCLAIMER

For R&D use only. Not for drug, household or other uses.

WARRANTY

The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Inc., shall not be held liable for any damage resulting from handling or from contact with the above product. See reverse side of invoice or packing slip for additional terms and conditions of sale. Copyright 2007 Sigma-Aldrich Co. License granted to make unlimited paper copies for internal use only.



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Product Information

TRITON X-100

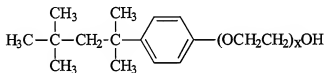
Product Number X-100, T9284, T8787, T8532

Storage Temperature 25°C

CAS #: 9002-93-1

Synonyms: X-100; TRITON X-100¹; Octylphenol ethylene oxide condensate¹

Product Description



$$x = 9-10$$

Appearance: Liquid, clear to slightly hazy, colorless to light yellow

Specific gravity: 1.065 at 25°C (approx. 1.07 g/mL)¹

Approximate Molecular Weight: 625¹

Effective molarity = 1.7 M for the neat liquid.¹

UV absorption: λ_{max} = 275 nm ($E^{1\%}$ = 23.9) and 283 nm ($E^{1\%}$ = 19.4) in methanol²

Typical values:

Viscosity (Brookfield): 240 cps at 25°C¹

Cloud point (1% aqueous solution): 63-69°C¹

Pour point: 7°C¹

pH (5% aqueous solution): 6.0 to 8.0¹

Calculated HLB value: 13.5¹

Critical micelle concentration (CMC): 0.22 to 0.24 mM^{3,4}

The structure of Triton X-100 is very similar to that of Igepal CA-630 (Sigma I3021) and of Nonidet P-40 (no longer commercially available); the names are sometimes reported as synonyms.⁵ However, Triton X-100 is slightly more hydrophilic than Igepal CA-630. The two are not considered to be functionally interchangeable in most applications.

Triton X-100 is a nonionic detergent, 100% active ingredient, which is often used in biochemical applications to solubilize proteins. Triton X-100 has no antimicrobial properties.¹ It is considered a comparatively mild non-denaturing detergent and is reported in numerous references. It does absorb in the ultraviolet region of the spectrum, so it can interfere

with protein quantitation by absorption at $A_{280\text{nm}}$. A number of polymeric resins have been used to remove X-100 from solution, including Amberlite hydrophobic XAD resins⁶ and Rezorian A161 cartridges.⁹

The "Triton X" series of detergents are produced from octylphenol polymerized with ethylene oxide. The number ("100") relates only indirectly to the number of ethylene oxide units in the structure. X-100 has an "average of 9.5" ethylene oxide units per molecule, with an average molecular weight of 625.^{1,3} In addition, lower and higher mole adducts will be present in lesser amounts, varying slightly within supplier's standard manufacturing conditions. A by-product formed during the reaction is polyethylene glycol, a homopolymer of ethylene oxide. Acid is also added to the product to neutralize the product after the base catalyzed reaction is completed. No antioxidants are added by Sigma or the manufacturer, but commercial preparations of Triton X-100 have been found to contain peroxides up to 0.22% hydrogen peroxide (H_2O_2) equivalents,⁷ which may interfere with biological reactions. Sigma offers X-100-PC and X-100R-PC as alternatives. Triton X-100 absorbs in the UV spectrum at approximately the same wavelength as proteins (280 nm). Sigma offers two "reduced", i.e., hydrogenated forms, X-100-RS and X-100R-PC that have significantly lower absorbance in this region.⁴

For lysing cells, typically about 0.1% X-100 solution in water will be sufficient, and even up to 0.5% concentrations will usually not harm most enzymes being isolated.³ Many enzymes remain active in the presence of X-100; for example, Proteinase K, remains active in 1% (w/w) solutions of X-100.⁸

Triton X-100 can be detected in the parts per million range by spectrophotometric measurement of the concentration of a Triton-ammonium-cobalt-thiocyanate complex.⁹ Interfering substances in this assay have been discussed.¹⁵

For a given application, the choice of a suitable surfactant depends on a number of variables, from its solubility, polarity and micelle size to the mechanism of its action with the target solute. The literature contains numerous articles.¹⁰⁻¹³

- Choice of detergent for solubilization of (erythrocyte) membranes¹⁰
- Effect of hydrophile-lipophile balance on (cytochrome) membrane solubilization¹¹
- Mode of interaction of polyoxyethylene glycol detergents with membrane protein¹²
- General background on surfactants and use in protein purification¹³

Preparation Instructions

Triton X-100 is soluble in all proportions at 25°C in water, benzene, toluene, xylene, trichloroethylene, ethylene glycol, ethyl ether, ethanol, isopropanol, and ethylene dichloride.¹ At 10% (v/v) in water, it gives a clear to slightly hazy solution, from clear to slightly yellow in appearance.³

Solutions are stable to autoclaving. At certain concentrations the solutions may be cloudy but dispersible above the cloud point; they should clear with stirring upon cooling.¹⁴

Storage/Stability

Triton X-100 is considered stable for years if stored sealed at room temperature. For special applications, storage under argon or nitrogen at 2-8°C may be preferred.

References

1. Supplier data (Triton X-100 is a product of Union Carbide.)
2. Wexler, A.S., *Anal. Chem.*, 35, 1936-1943 (1963).
3. Sigma data.
4. Tiller, G.E. et al., *Anal. Biochem.*, 141, 262 (1984).
5. The Merck Index, 11th ed., #6681 (1989).
6. Holloway, P.W., *Anal. Biochem.*, 53, 304 (1973).
7. Ashani, Y. and Catrovas, G.N., *Anal. Biochem.*, 109, 55-62 (1980).
8. *Enzymes of Molecular Biology*, M.M. Burrell, Ed. (Humana Press, NJ, 1993), p. 307.
9. Supplier method, based on work by Crabb, N.T. and Persinger, H.E., *J. Amer. Oil Chem. Soc.*, 41, 752-755 (1964) and Greff, R.A. et al., *J. Amer. Oil Chem. Soc.*, 42, 180-185 (1965).
10. Grant, D.A. and Hjerten, S., *Biochem. J.*, 164, 465-468 (1977).
11. Slinde, E. and Flatmark, T., *Biochem. Biophys. Acta*, 455, 796-808 (1976).
12. Le Maire, M. et al., *Eur. J. Biochem.*, 129, 525-532 (1983).
13. *Methods in Enzymology*, 182, 239-282 (1990): reviews by Neugebauer, J.M., Hjelmeland, L.M., etc.
14. Supplier information.
15. Goldstein, S. & Blecher, M., *Anal. Biochem.*, 64, 130-135, (1975).

ckv 4/21/99

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EXHIBIT C



Material Safety Data Sheet

ALKAMULS EL-620

Date Prepared: 11/09/04

Supersedes Date: 7/03/01

1. PRODUCT AND COMPANY DESCRIPTION

RHODIA INC.
HOME, PERSONAL CARE & INDUSTRIAL INGREDIENTS
CN 7500
Prospect Plains Road
Cranbury NJ 08512-7500

Emergency Phone Numbers:

FOR EMERGENCIES INVOLVING A SPILL, LEAK, FIRE, EXPOSURE OR ACCIDENT CONTACT: CHEMTREC (800-424-9300 within the United States or 703-527-3887 for international collect calls) or Rhodia CAERS (Communication and Emergency Response System) at 800-916-3232.

For Product Information:

(800) 973-7873

Chemical Name or Synonym:

CASTOR OIL ETHOXYLATE(30)

2. COMPOSITION/INFORMATION ON INGREDIENTS

Component	CAS Reg Number	OSHA Hazard	Percentage
CASTOR OIL ETHOXYLATES	61791-12-6	N	> 99
WATER	7732-18-5	N	< 1
DIOXANE	123-91-1	Y	< 0.0001
OXIRANE	75-21-8	Y	< 0.0001

3. HAZARDS IDENTIFICATION

A. EMERGENCY OVERVIEW:

Physical Appearance and Odor:

yellow viscous liquid, slight odor.



RTD HallStar, Inc.
1500 Route 517 Suite 305
Hackensack, NJ 07840
908-852-6128 Fax 908-852-1335
rtdhallstar@cphall.com

Warning Statements:

Based on currently available data, this product does not meet the regulatory definition of a hazardous substance. However, good industrial hygiene practices should be used in handling it.

B. POTENTIAL HEALTH EFFECTS:

Acute Eye:

Non-irritating. May cause redness, irritation, on prolonged contact.

Acute Skin:

Slightly irritating. May cause redness, irritation.

Acute Inhalation:

Inhalation not likely.

Acute Ingestion:

Practically non-toxic.

Chronic Effects:

This product does not contain any ingredient designated by IARC, NTP, ACGIH or OSHA as probable or suspected human carcinogens.

4. FIRST AID MEASURES

FIRST AID MEASURES FOR ACCIDENTAL:

Eye Exposure:

Hold eyelids open and flush with a steady, gentle stream of water for at least 15 minutes. Seek medical attention if irritation develops or persists or if visual changes occur.

Skin Exposure:

In case of contact, immediately wash with plenty of soap and water for at least 5 minutes. Seek medical attention if irritation develops or persists. Remove contaminated clothing and shoes. Clean contaminated clothing and shoes before re-use.

Inhalation:

Inhalation is not an expected route of exposure. If respiratory irritation or distress occurs remove victim to fresh air. Seek medical attention if respiratory irritation or distress continues.

Ingestion:

If victim is conscious and alert, give 1-2 glasses of water to drink. Do not give anything by mouth to an unconscious person. Seek medical attention. Do not leave victim unattended.

MEDICAL CONDITIONS POSSIBLY AGGRAVATED BY EXPOSURE:

Skin contact may aggravate existing skin disease.

NOTES TO PHYSICIAN:

All treatments should be based on observed signs and symptoms of distress in the patient. Consideration should be given to the possibility that overexposure to materials other than this product may have occurred.

Treat symptomatically. No specific antidote available.

5. FIRE FIGHTING MEASURES

FIRE HAZARD DATA:

Flash Point:
> 293 C (559 F). Flammability Class: WILL BURN.

Method Used:
Closed cup

Flammability Limits (vol/vol%):	Lower:	Upper:
	No Data	No Data

Extinguishing Media:
Recommended (small fires): dry chemical, carbon dioxide, Recommended (large fire): alcohol foam, universal foam, water spray, Not recommended: water jet (frothing possible).

Special Fire Fighting Procedures:
Firefighters should wear NIOSH/MSHA approved self-contained breathing apparatus and full protective clothing.

Unusual Fire and Explosion Hazards:
Product will burn under fire conditions.

Hazardous Decomposition Materials (Under Fire Conditions):
oxides of carbon

6. ACCIDENTAL RELEASE MEASURES

Evacuation Procedures and Safety:
Wear appropriate protective gear for the situation. See Personal Protection information in Section 8.

Containment of Spill:
Follow procedure described below under Cleanup and Disposal of Spill.

Cleanup and Disposal of Spill:
Absorb with an inert absorbent. Sweep up and place in an appropriate closed container (see Section 7: Handling and Storage). Clean up residual material by washing area with water. Collect washings for disposal.

Environmental and Regulatory Reporting:
Do not flush to drain. Spills may be reportable to the National Response Center (800-424-8802) and to state and/or local agencies.

7. HANDLING AND STORAGE

Minimum/Maximum Storage Temperatures:
15 to 49 C (59 to 120 F)

Handling:
Avoid breathing vapors and mists. Avoid direct or prolonged contact with skin and eyes. In cold weather, this product may stratify and freeze. This does not damage the product. If freezing occurs, thaw and remix before using. Frozen material may be thawed in a warm room. Avoid localized overheating. Vent drums while heating. Mix thoroughly to assure homogeneity.

Ethylene oxide may collect in container head space. Although concentrations are expected to remain below

established exposure limits, provide adequate ventilation when accessing or working with open containers and tanks.

Storage:

Store in tightly closed containers. Store in an area that is dry, well-ventilated, away from ignition sources, away from incompatible materials (see Section 10. Stability and Reactivity).

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Introductory Remarks:

These recommendations provide general guidance for handling this product. Because specific work environments and material handling practices vary, safety procedures should be developed for each intended application. While developing safe handling procedures, do not overlook the need to clean equipment and piping systems for maintenance and repairs. Waste resulting from these procedures should be handled in accordance with Section 13: Disposal Considerations.

Assistance with selection, use and maintenance of worker protection equipment is generally available from equipment manufacturers.

Exposure Guidelines:

No exposure limits were found for this product or any of its ingredients.

Engineering Controls:

Where engineering controls are indicated by use conditions or a potential for excessive exposure exists, the following traditional exposure control techniques may be used to effectively minimize employee exposures: general area dilution/exhaust ventilation.

Respiratory Protection:

When respirators are required, select NIOSH/MSHA approved equipment based on actual or potential airborne concentrations and in accordance with the appropriate regulatory standards and/or industrial recommendations.

For reasonably foreseeable industrial end uses of this material, respiratory protection should not be necessary.

Eye/Face Protection:

Eye and face protection requirements will vary dependent upon work environment conditions and material handling practices. Appropriate ANSI Z87 approved equipment should be selected for the particular use intended for this material.

Eye contact should be prevented through use of chemical safety glasses with side shields or splash proof goggles. An emergency eye wash must be readily accessible to the work area.

Skin Protection:

Skin contact should be minimized through use of gloves and suitable long-sleeved clothing (i.e., shirts and pants). Consideration must be given both to durability as well as permeation resistance.

Work Practice Controls:

Personal hygiene is an important work practice exposure control measure and the following general measures should be taken when working with or handling this material:

- (1) Do not store, use, and/or consume foods, beverages, tobacco products, or cosmetics in areas where this material is stored.
- (2) Wash hands and face carefully before eating, drinking, using tobacco, applying cosmetics, or using the toilet.
- (3) Wash exposed skin promptly to remove accidental splashes or contact with this material.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical and Chemical properties here represent typical properties of this product. Contact the business area using the Product Information phone number in Section 1 for its exact specifications.

Physical Appearance:

yellow viscous liquid.

Odor:

slight odor.

pH:

6.5 to 8.5 at 7 wt/wt%.

Specific Gravity:

Not Available

Density:

1.04 to 1.05 g/ml at 25 C (77 F).

Water Solubility:

soluble

Melting Point Range:

Not Available

Freezing Point Range:

< 5 C (41 F)

Boiling Point Range:

> 200 C (392 F) at 760 mmHg

Vapor Pressure:

< 0.01 mmHg at 25 C (77 F)

Vapor Density:

Not Available

Percent Volatiles by Volume:

< 1

Viscosity:

viscosity (centipoises) : 250 to 1000 cps at 25 C (77 F).

10. STABILITY AND REACTIVITY

Chemical Stability:

This material is stable under normal handling and storage conditions described in Section 7.

Conditions To Be Avoided:

heat
open flame
spark

Materials/Chemicals To Be Avoided:

strong oxidizing agents
strong reducing agents

The Following Hazardous Decomposition Products Might Be Expected:

Decomposition Type: thermal

oxides of carbon

Hazardous Polymerization Will Not Occur.

Avoid The Following To Inhibit Hazardous Polymerization:

not applicable

11. TOXICOLOGICAL INFORMATION

Acute Eye Irritation:

Toxicological Information and Interpretation:

eye - eye irritation, rabbit. Non-irritating.

Acute Skin Irritation:

Toxicological Information and Interpretation:

skin - skin irritation, rabbit. Slightly irritating.

Acute Dermal Toxicity:

No test data found for product.

Acute Respiratory Irritation:

No test data found for product.

Acute Inhalation Toxicity:

No test data found for product.

Acute Oral Toxicity:

Toxicological Information and Interpretation:

LD50 - lethal dose 50% of test species, 40000 mg/kg, rat.

Chronic Toxicity:

This product does not contain any substances that are considered by OSHA, NTP, IARC or ACGIH to be "probable" or "suspected" human carcinogens.

No additional test data found for product.

12. ECOLOGICAL INFORMATION

Ecotoxicological Information:

Not expected to cause significant adverse environmental impact if product reaches waterways.

Chemical Fate Information:

Inherently biodegradable.

13. DISPOSAL CONSIDERATIONS

Waste Disposal Method:

Chemical additions, processing or otherwise altering this material may make the waste management information presented in this MSDS incomplete, inaccurate or otherwise inappropriate. Please be advised that state and local requirements for waste disposal may be more restrictive or otherwise different from federal laws and regulations. Consult state and local regulations regarding the proper disposal of this material.

Container Handling and Disposal:

Any containers or equipment used should be decontaminated immediately after use.

EPA Hazardous Waste - NO

14. TRANSPORTATION INFORMATION

Transportation Status: IMPORTANT! Statements below provide additional data on listed DOT classification.

The listed Transportation Classification does not address regulatory variations due to changes in package size, mode of shipment or other regulatory descriptors.

US Department of Transportation

Shipping Name:

NOT REGULATED

15. REGULATORY INFORMATION

Inventory Status

Inventory	Status
UNITED STATES (TSCA)	Y
CANADA (DSL)	Y
EUROPE (EINECS/ELINCS)	P
AUSTRALIA (AICS)	Y
JAPAN (MITI)	Y
SOUTH KOREA (KECL)	Y

Y = All ingredients are on the inventory.

E = All ingredients are on the inventory or exempt from listing.

P = One or more ingredients fall under the polymer exemption or are on the no longer polymer list. All other ingredients are on the inventory or exempt from listing.

N = Not determined or one or more ingredients are not on the inventory and are not exempt from listing.

FEDERAL REGULATIONS

Inventory Issues:

All functional components of this product are listed on the TSCA Inventory.

SARA Title III Hazard Classes:

Fire Hazard	- NO
Reactive Hazard	- NO
Release of Pressure	- NO
Acute Health Hazard	- NO
Chronic Health Hazard	- NO

OTHER FEDERAL REGULATIONS:**FDA Status:**

This product meets the compositional requirements of:
21 CFR 175.105 ADHESIVES
21 CFR 176.210 DEFOAMING AGENTS USED IN OF PAPER & PAPERBOARD

STATE REGULATIONS:

This product contains the following components that are regulated under California Proposition 65:

Ingredient Name	Cancer List	Reprod. List	No Sign. Risk Lvl (ug/day)	
			California	RPI
DIOXANE	Y	N	30	ND
OXIRANE	Y	Y	2	ND

16. OTHER INFORMATION**National Fire Protection Association Hazard Ratings--NFPA(R):**

1	Health Hazard Rating--Slight
1	Flammability Rating--Slight
0	Instability Rating--Minimal

**National Paint & Coating Hazardous Materials Identification System--HMIS(R):**

1	Health Hazard Rating--Slight
1	Flammability Rating--Slight
0	Reactivity Rating--Minimal

**Reason for Revisions:**

Change and/or addition made to Section 2, Section 12, Regulatory Review and Update.

Key Legend Information:

ACGIH - American Conference of Governmental Industrial Hygienists
OSHA - Occupational Safety and Health Administration
TLV - Threshold Limit Value
PEL - Permissible Exposure Limit
TWA - Time Weighted Average
STEL - Short Term Exposure Limit
NTP - National Toxicology Program
IARC - International Agency for Research on Cancer
ND - Not determined
RPI - Rhodia Established Exposure Limits

**Disclaimer:**

The information herein is given in good faith but no warranty, expressed or implied, is made.

EXHIBIT D

Technical Bulletin

MAZCLEAN™ EP PROPRIETARY EMULSIFIER

MAZCLEAN EP is a formulated emulsifier designed to produce clear microemulsions of d-limonene and water containing up to 30% d-limonene by weight. D-limonene is a citrus by-product and the major component of orange oil. It is a monocyclic terpene hydrocarbon possessing excellent solvency and fragrance properties. Microemulsions of MAZCLEAN EP, d-limonene, and water can be used as water-based degreasers, all-purpose cleaners with a natural lemon fragrance, lotion-type waterless hand cleaners, and in other formulations where biodegradability, grease removal, low skin irritation, and pleasant fragrance are needed. Because the microemulsion is a clear product, it can be easily blended with other detergent ingredients and colored to produce attractive consumer cleaning products that are safe and effective to use.

Use Instructions:

When making microemulsions, the order of addition of each component is important. MAZCLEAN EP should always be added to the d-limonene and thoroughly mixed before introducing any water to the system. MAZCLEAN EP should be added at a ratio of 2 parts for every 3 parts d-limonene. After these products are blended, water may be added to produce the desired final microemulsion strength. If water is introduced to the d-limonene prior to adding emulsifier, then the resulting mixture will either be hazy or will form a stable emulsion.

Dilution of a concentrated microemulsion is accomplished by adding water to the concentrate. This will insure that the diluted solution remains clear. If the concentrate is added to water, it will form a stable emulsion, although degreasing detergency, and fragrance properties are unchanged.

MAZCLEAN is a trademark of BASF Corporation

For More Information

Order Placement

To place orders for delivery in the United States please call our toll free number (800) 443-6460. To place orders for delivery in Canada please call BASF Canada at (800) 267-2955.

For Other Information

Including product literature and Material Safety Data Sheets please call (847) 249-6750.

Or Visit Our Website At:

www.performance.basf-corp.com

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BASF Corporation
3000 Continental Drive-North
Mount Olive, New Jersey 07828-1234
800-443-6460

Specifications

Free Amine (MW 105), %.....	0.0 - 2.8
Appearance @ 25 °C.....	Clear To Slightly Hazy Liquid
Color, Gardner.....	5.0 Max.

Typical physical properties

Purity.....	100% organic content
pH (1% Solution).....	9.7
Specific Gravity @ 25 °C.....	1.01
Flash Point, PMCC, °F.....	>200

Microemulsions of d-limonene and water are safe and versatile ingredients for many cleaning and degreasing compounds to replace less desirable solvent systems. MAZCLEAN EP enables the formulator to prepare microemulsions with ease and opens the door to new possibilities for biodegradable systems.

Shelf Life:

BASF will endorse the results on the certificate of analysis for a period of up to one year from the date of manufacture for material in original, unopened, properly stored containers. Beyond one year, we recommend the quality of the material be confirmed prior to use, by retesting the certificate of analysis parameters.

Please refer to the Material Safety Data Sheet (MSDS) for this product for instructions on safe and proper handling and disposal.

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